

Appl. No. 09/937129  
Amdt. dated Feb. 13, 2004  
Reply to Office action of Nov. 14, 2003

### REMARKS

New claim 30 is claim 1 rewritten to improve the clarity of the original claim. Claim 1 is cancelled. Claims 2, 5, 21, 23 and 28 are amended to correct dependency. The claims are supported by the application as originally filed and no new matter is added.

Claims 1-5, 21-23 and 28 are rejected under 35 U.S.C. §112, first paragraph as failing to comply with the written description requirement. Applicants traverse the rejection to the extent that it may be maintained.

Claim 1 is cancelled and replaced by new claim 30. Claims 2-5, 21-23 and 28 depend directly or indirectly from claim 30. Claim 30 now clearly recites that first filtration layer prepared from filament nonwoven comprises thermoplastic fiber having intersections and at least a part of the fiber intersections are thermally bonded. The claim is silent with respect to bonding fiber intersections of the second filtration layer as the second filtration layer is not dependent on a particular kind of nonwoven and may be comprised of any material that satisfies the particle size exclusion criteria recited in the claim. Examples of suitable materials for the second filtration layer are described, for example, at pages 54-55 and the structure of filtration cartridges is shown in figures 18-19. Applicants respectfully submit that claim 30 is within the scope of the elected species and complies with the written description requirement of 35 U.S.C. §112, first paragraph. Examiner is requested to withdraw the rejection on this ground.

Claims 1-5, 21-22 and 28 are rejected under 35 U.S.C. §103(a) as being unpatentable over JP 5-2715 ('715) in view of U.S. Patent 6,090,731 ('731) to Pike et al and EP 313,920 ('920). Applicants traverse the rejection to the extent that it can be maintained.

Claim 30 now clearly distinguishes Applicants' invention from the cited art. JP '715 discloses a cartridge filter comprising an inside filter layer of slit nonwoven fabric made from ultra fine fiber and an outer filter of slit nonwoven fabric having a courser fiber. Both the inner filter layer and the outer filter layer are formed by winding the nonwoven fabric around a perforated cylinder. The nonwoven fabric is made from split staple fiber ('715 par. 0007 and par. 0010). The difference in thickness of the split staple fiber of the inside layer and that of the outside layer determine the efficiency of the filter cartridge ('715 par. 0010). Staple fiber is fiber

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cut to specific lengths (e.g. see examples describing various cut lengths) whereas filament fiber is of indefinite length. JP '715 does not teach or suggest a filter cartridge having a first filtration layer formed from by winding in twill form a strip of filament nonwoven around a second layer that has an initial 80% trapped particle diameter that is 0.05 to 0.9 times as large as the initial 80% trapped particle diameter on of the first filtration layer. The second filtration layer of Applicants' invention does not depend on the material used for the layer (page 53 lines 8-10). The second filtration layer is characterized by its ability to trap particles smaller than the particles trapped by a first filtration layer. This is not a matter of optimizing the performance of similar structures. The structures claimed by Applicants and that taught by '715 are different, and it is respectfully submitted that the claimed structure is not taught or suggest by '715.

Pike et al. (US '731) disclose a filter medium comprising a first layer comprising a nonwoven web of autogenously bonded, uncrimped multi-component spun bonded fibers and a second layer laminated to the first layer. The second layer comprises a microfiber web. US '731 does not provide any teaching with respect to filter cartridges much less a cartridge filter having the structure claimed by Applicants. Further, US '731 provides no teaching regarding a filter cartridge having first and second layers that trap particles having different diameters. Examiner cites US '731 for teaching thermal bonding of fiber intersections. However, Applicants respectfully submit that the combination of JP '715 and US '731 fail to teach Applicants' invention as a whole.

EP '920 is cited for teaching the concept of winding a filter media in a twill form and suggests that such a configuration prevents deformation of the media due to fluid pressure thereby enabling efficient removal of particles. EP '920 discloses a process for producing a precision cartridge filter which comprises the step of (1) preparing a web composed of conjugate microfibrils by a conjugate melt-blow process and (2) heating the web and molding it to the shape of the cartridge filter. EP '920 does not teach or suggest a cartridge comprising two kinds of filtration layers. Nor does it teach or suggest the filtration performance achieved from the two layered structure claimed by Applicants.

Applicants respectfully submit that the combination of references cited by Examiner fail to teach or suggest the claimed invention as a whole. Examiner cites In re Antonie, F2d 618, 195

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USPQ 6 (CCPA 1977) for the proposition that a modification of prior art would have been obvious to optimize the filter for a particular application. In re Antonie is clearly inapposite to the facts of this application. The examiner in In re Antonie cited a single reference teaching the basic structure of the claimed device, but the reference was silent with respect to quantitative design parameters. The court noted that a result effective variable is part of the invention as a whole, and that there was no evidence of record that the claimed parameter was a result effective parameter. Likewise, there is no teaching from the combined cited art of the structure of the claimed invention or the quantitative design parameters claimed for the structure. The cited art individually or in combination do not teach or suggest Applicants' invention as a whole. Applicants respectfully request Examiner to withdraw the rejection of claim 30 on this ground.

Claims 2-5, 21-22 and 28 depend directly or indirectly from claim 30. For the reasons stated above, claim 30 is allowable. Therefore, claims depending from claim 30 are likewise allowable. Applicants respectfully request Examiner to withdraw the rejection of claims 2-5, 21-22 and 28 on this ground.

Claim 23 is rejected under 35 U.S.C. §103(a) as being unpatentable over JP 5-2715 ('715) in view of U.S. Patent 6,090,731 ('731) to Pike et al and further in view of Buerger et al. (US 5,562,041). Applicants traverse the rejection to the extent that it can be maintained.

Claim 23 depends directly from claim 30. For the reasons stated above, claim 30 is allowable. Therefore, claims depending from claim 30 are likewise allowable. Applicants respectfully request Examiner to withdraw the rejection of claim 23 on this ground.

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In view of the above amendments and remarks, Applicants respectfully request a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

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Dated: February 13, 2004

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